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ABSTRACT

A study aimed to increase understanding of how different writing-to-learn tasks invite the ways in which students construct meaning in writing from sources. The tasks used, writing either a report or a problem-based essay, required students to integrate prior knowledge with information from six textual sources in order to construct their own texts. Fifteen undergraduates, enrolled in a seminar on European history, were randomly assigned to one of two task conditions. Comparisons were made between the ways in which the two groups interpreted the tasks they were given, as well as how they organized and selected content from the sources. All students provided think-aloud protocols and reading-writing logs. Students' essays were analyzed for top-level structure, origin of information, and appeals to authority. Comparisons were also made to examine possible differences in learning associated with the two tasks. Analyses showed that the groups differed significantly in their interpretations of the two tasks and in their approaches to structuring textual information. Analyses also revealed that students writing problem-based essays included significantly more content units in their essays than students writing reports. Results suggest that authority can be linked to the transformations writers make in composing from sources as they interweave content from prior knowledge with source information and restructure meaning. Authority can also come from writers' awareness of how to apply their knowledge flexibly and effectively in a given rhetorical situation. (Two figures and 6 tables of data are included; 90 references are attached.) (Author/SR)

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CENTER FOR THE STUDY OF WRITING

Technical Report No. 55

WRITING FROM SOURCES: AUTHORITY IN TEXT AND TASK

Stuart Greene

October, 1991

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Abstract

The purpose of this study was to increase understanding of how different writing-to-learn tasks invite the ways in which students construct meaning in writing from sources. The tasks used in this study, writing either a report or a problem-based essay, required students to integrate prior knowledge with information from six textual sources in order to construct their own texts. The fifteen undergraduates, enrolled in a seminar on European history, were randomly assigned to one of two task conditions, report or problem. Comparisons were made between the ways in which the two groups interpreted the tasks they were given, as well as how they organized and selected content from the sources. For insights into how writers approached these two tasks, all students provided think-aloud protocols and reading-writing logs. Students' essays were analyzed for top-level structure, origin of information, and appeals to authority. Comparisons were also made to examine possible differences in learning associated with the two tasks. Analyses showed that the groups differed significantly in their interpretations of the two tasks and in their approaches to restructuring textual information. Analyses also revealed that students writing problem-based essays included significantly more content units in their essays than students writing reports. The study suggests that authority can be linked to the transformations writers make in composing from sources as they interweave content from prior knowledge with source information and restructure meaning. Authority can also come from writers' awareness of how to apply their knowledge flexibly and effectively in a given rhetorical situation.

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WRITING FROM SOURCES: AUTHORITY IN TEXT AND TASK

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Common academic writing tasks often require students to synthesize information from different sources. We expect students to think critically about what they read, integrate information from sources with their own knowledge, and structure their work in ways that adhere to the forms and conventions within a given discipline. In doing so, they must somehow balance individual contribution to the shared knowledge of a field with a need to demonstrate their knowledge of what others have said (Kaufer & Geisler, 1989). In short, the critical features of academic writing (Flower, 1990) require that students adapt and transform their understanding of issues in a given field in light of their own rhetorical intentions.

Yet the ways in which complex reading-to-write tasks affect how writers construct and transform meaning or how such tasks promote learning remain relatively unexamined, particularly in disciplinary contexts (cf. Herrington, 1985, 1988; Marshall, 1987). For instance, we know little about the approaches college-level students are asked to take in representing historical events, which include writing informational reports, or accounts, and problem-based essays (cf. Stanford, 1987). An informational report entails providing a coherent explanation and analysis of events leading up to or issues surrounding an historical event. A problem-based task entails speculating about solutions to unresolved issues, reformulating and extending the material from sources in supporting a particular interpretation or point of view. Though Applebee (1984) has speculated that different types of writing, such as writing a summary or analysis, entail orchestrating "different combinations of skills in the process of writing" (p. 55; cf. Langer & Applebee, 1987), he also observes that, even within specific types of writing, the forms and conventions of academic disciplines differ (cf. Jolliffe & Brier, 1988). Thus, some key questions remain: how do different tasks of writing from sources influence the ways in which students construct meaning and learn the "conceptual structures" of a given discipline? In addition, how can we describe the authoritative ways that students use sources in order to make a contribution to a scholarly conversation?

Exploring the authoritative ways students use sources is particularly relevant given the nature of academic writing and the "struggle" students often experience as they learn the ways of thinking in a particular discipline (Kirsch, 1991). After all, students are expected to synthesize different points of view, apply their understanding of concepts in novel situations, and exercise their own *authority* within certain linguistic and rhetorical conventions. By this I mean that students assume the role of *participants* who contribute to ongoing discussions in a field by adding relevant information not found in sources, restructuring meaning, and adapting source content to meet their goals as writers in a given rhetorical situation (cf. Greene, 1991). Such a view of authority distinguishes itself from traditional conceptions that locate authority in culturally established traditions or texts (e.g., Hirsch, 1987) and more recent attempts to study the notion of authority as a critical referent for examining the political and ethical basis of schooling (e.g., Giroux, 1988). These attempts are abstract, removed from the practices of individuals in different social contexts. If we are to build theory, then we need to assess how students weigh options, make choices, and write in contexts that enable us to look at authority up close. For instance, how do writers integrate source information with prior knowledge and experience in constructing new representations of meaning? What kinds of tasks prompt writers to

restructure and reconfigure meaning or to generate relevant content to make new connections?

Some educators have argued that task can foster "independence" and "responsibility," particularly when we let students write about open-ended issues (e.g., Coon, 1989). Others suggest that authority can be motivated and supported by engaging students in scholarly projects, so that they can write from within the academic community (Bartholomae, 1985; cf. Bartholomae & Petrosky, 1986). Yet how people use sources in authoritative ways to fulfill their rhetorical intentions and to make a contribution is underspecified (cf. Mortensen, 1989). My own approach to studying task, the construction of meaning, and authority is to examine the ways in which people (a) interpret different tasks of writing; (b) organize meaning in text to form new concepts; (c) integrate relevant prior knowledge and experience with source content; and (d) appeal to authorities in sources to support an argument, demonstrate their knowledge of important issues and ideas, or to play one discourse off of another in order to establish their own point of view (Greene, 1989; cf. Kaufer & Geisler, 1991).

BACKGROUND

That the tasks of writing either a report or problem-based essay can differentially affect the ways in which people construct meaning and use sources is based primarily on constructivist theories of reading and writing. Constructivist theories of text processing can provide a lens through which to examine how learners transform source texts to create new texts. Moreover, the theories of constructive processing that follow are central to my own goals: to examine the kinds of transformations readers and writers make as they construct meaning for different purposes, the authoritative ways they use sources as they organize and select information, and the possible kinds of learning that these two tasks promote.

Constructivism portrays readers as actively building a mental representation by connecting given information to previously acquired knowledge (Spiro, 1980). Readers organize this representation, using the structure of the text or another structure they generate from their cognitive repertoires (Spivey, 1987). Since readers cannot attend to all of the information in a text, they also employ certain relevance principles that guide the selection of information, for instance determining the importance of information by where it is placed in the structure of a text (Hidi & Anderson, 1986) or using prior knowledge of a particular genre (cf. Hayes, Waterman, & Robinson, 1977). Such a view of language comprehension suggests that understanding entails making "an effort after meaning" (Bartlett, 1932). That is, meaning does not reside in texts. Instead, readers construct meaning using textual cues and prior knowledge organized in cognitive structures or schemas (Bransford & Johnson, 1973). As they interact with written texts, readers make connective inferences, elaborate, and fill in gaps as they build a "textual world" of meaning (Beaugrande & Dressler, 1981).

In a classic study, Frederiksen (1972, 1975) found that different tasks influence the extent to which people draw inferences from a source text, generate content not directly linked to a source, and transform the semantic content of a text in building a mental representation. In particular, his work has provided some evidence that readers who are asked to recount information based on their understanding of a text rely on that text more than readers invited to apply their knowledge to solve a problem. In solving a problem, readers make more inferences cued by a text, generate more content, and construct a significantly different representation of the semantic content of the text. Yet would these differences prevail when readers read in light of their goals as writers, adapting information for an audience? How do people restructure in writing a report versus writing a problem-

based essay? Are people writing an informational report more inclined to rest on the authority of sources than those writing a problem-based essay? Under what conditions are students willing to generate content from prior knowledge, asserting their authority as they make new connections? In essence, we know little about how students approach the tasks Frederiksen examined and how their approaches might vary in different contexts, particularly in the classroom, where academic work is often transformed (Doyle, 1983).

Research revealing differences between the cognitive operations involved in analytic and summary writing is particularly relevant to my investigation of report writing and problem-based essay writing, though this work has focused on reading-to-write tasks based on single sources. Using think-aloud protocols to study the effects of these two kinds of writing tasks on learning, Durst (1987) found that an analytic writing task prompted students to engage in more varied and complex thinking than did a summary task. Those writing analyses structured high-level plans, formulated questions, interpreted the source texts, and evaluated their own essays. In contrast, students writing summaries focused primarily on "bits of text" without attending to the overall framework and meaning of the source text (p. 373). Interestingly, though the types of reasoning fostered by these two tasks differed, students' essays in both task groups looked surprisingly similar. Nonetheless, Durst concluded that analytical writing can serve as a heuristic for thinking critically about a subject. Others have also suggested that analytic writing can enable learners to integrate prior knowledge with what they read (e.g., Newell, 1984; cf. Newell & Winograd, 1989) and encourages them to form abstract concepts that not only enhance learning in an immediate situation, but learning that can be applied to new situations (Copeland, 1985; Copeland, in press).

Finally, research has begun to show that different tasks, such as writing a summary or an analysis, can invite students to construct different representations of meaning. As students perform these tasks, they engage in different operations of selecting and organizing textual information. In a series of three studies, Langer and Applebee (1987) observed that summary writing leads to interactions with a broader scope of content in composing and comprehending than analytic writing, which focuses writers' attention on a relatively limited set of information relevant to a thesis. In addition, those writing summaries tended to recast information in their own language, though they relied on the structure of a source text in organizing their ideas. Those writing analytical essays were guided by their own reformulations of source information, selecting information to support a point of view as opposed to reviewing information. Langer and Applebee conclude that different kinds of writing apparently lead students to focus their attention on different kinds of information and to think about this information in different ways.

While the findings of this group of studies are important for developing a theory of task and learning, one must question the assumptions that have framed the way these researchers have defined summary writing. Applebee (1984) defines summary as a "generalized narrative" that is assumed to be a generically simpler task than an analysis. He argues that writing a summary, after all, relies to a great extent on the narrative structure of a source text (cf. Britton, Burgess, Martin, McCleod, & Rosen, 1975; Durst, 1987; Newell, 1984). He contrasts summary writing with analysis, contending that writing an analytical essay requires a writer to employ more "logical modes of argumentation and organization, relying more heavily on classification and categorization" (p. 57). What is problematic in these characterizations of summary and analysis is that mode of writing and process appear to be conflated, thus obviating the potential complexity of writing for different purposes. After all, Brown and Day (1983a, 1983b; cf. Hidi & Anderson, 1986) point out that summary writing is a relatively complex task that entails orchestrating different cognitive skills for different purposes. In fact, writing a summary incorporates some important analytical skills, for instance, substituting superordinate concepts for more

isolated bits of information and integrating information from a text within a writer's own framework, all of which may entail extensive planning (Brown, Day, & Jones, 1983a; cf. Ratteray, 1985).

Research on discourse synthesis provides a useful framework for thinking about how constructive processing can vary, suggesting ways in which "constructivist notions" can be applied to "literate acts that involve the making of meaning through both processes, reading and writing, operating in concert" (Spivey, 1990, p. 257). As writers perform different tasks, such as writing an informational report (Spivey, 1984; Spivey & King, 1989) or an analytical essay (Ackerman, 1989), they build different representations of meaning because these tasks invite people to perform the operations of organizing, selecting, and connecting differently. Different transformations of meaning would result because these tasks appear to require different methods of reorganization and a different basis for selecting information from sources. Each task also provides a different configuration of meaning, or structure, that constrains the extent to which writers will add information from prior knowledge and make new connections or rely on the authority of source texts. However, the extent to which writers generate content, adding information from prior knowledge beyond constructing a coherent representation of meaning, appears to depend on whether a writer has sufficient background knowledge (e.g., Ackerman, 1990), or whether the relevant information is in the sources (Spivey, 1990). The extent to which people generate content can also depend on the configuration, or structure, of meaning provided by a task.

The ways students interpret a task can also affect the extent to which they include previously acquired knowledge or rely on the authority of texts as a source of information (e.g., Ackerman, 1990). Research on composing suggests the critical role that task interpretation can play in learning, though this work has focused on students' performance on relatively open-ended tasks of writing from sources (Flower, 1987; Flower, et al., 1990). The ability to fulfill the tasks of academic work depends on a writer's ability to specify what is asked for in a given assignment, defining goals in relation to context, the source texts, the audience, and purpose (cf. Penrose, 1987). Learners make sense of new texts and new situations by making connections to familiar tasks and contexts, thus calling attention to the intertextual nature of this process (Rowe, 1987).

Studies have also begun to reveal the extent to which these values and beliefs shape students' initial interpretations of a task, interpretations that affect planning, as well as the organization and selection of information (e.g., Nelson, 1990; Nelson & Hayes, 1988). In doing so, these studies also point to contextual factors that shape students' evolving interpretation of a given task and the strategies they employ in performing complex tasks of writing from multiple sources. Whether students use high investment strategies, defining their own rhetorical purpose, or low investment strategies, getting the work done with minimal effort and relying on the authority of sources, depends, in large part, on how teachers view language, the process of writing and the purpose of composing. Equally important are students' perceptions of how they expect the teacher to respond (Herrington, 1985; Marshall, 1987). If students know they have opportunities to share their writing and receive feedback during the process of writing, then they are more likely to develop rich representations of audience and purpose that guide more goal-directed strategies in reading and writing. In these ways, task and context can shape the social purposes for writing, the persona writers adopt in composing, and their perceptions of what it means to think and act in different disciplinary forums (Herrington, 1985).

Despite the growing body of research in discourse synthesis, we still need to know a great deal more about the kinds of textual transformations that people make in writing from multiple sources. As Spivey (1990) has pointed out, we know relatively little about

the complex transformations that writers perform as they appropriate source information in light of their discourse goals, in particular the structural transformations they make and the conditions that influence the extent to which writers interweave prior knowledge with textual information. What happens to a text when readers are also writers (cf. Greene, 1991)?

PURPOSE AND DESIGN

In the broadest sense, this study addressed two questions: How do problem-based and report tasks differentially affect the ways students construct meaning and learn historical concepts? How can we characterize the authoritative ways in which students use sources? More specifically, this research explored four key questions:

1. How are the problem-based and report tasks construed by the students who performed them? What perceptions of authority are associated with the two tasks?

2. How do the tasks affect the structure of writers' texts?

3. How do problem-based and report tasks affect writers' selection of information in writing synthesis texts?

4. Do the two tasks differentially affect qualitative changes in knowledge?

These questions were motivated by four assumptions informed by research and theory in the constructivist tradition. First, task interpretation can provide insights into whether people see their task as inviting them to restructure information, to rely on the authority of sources, or contribute relevant information from prior knowledge. Second, different tasks lead people to restructure content and configure it in a different way. Third, different tasks can lead to different selection principles and, therefore, different use of sources. People writing informational reports, for example, may be more inclined to rest on the authority of sources than those writing problem-based essays. People performing these two tasks may also appeal differently to sources. Fourth, since writers appear to build different representations of meaning because they perform the operations of organizing and selecting information differently, then one might speculate that such tasks can differentially affect qualitative changes in learning.

This study also explores possible ways in which an instructional context can influence the kinds of transformations of meaning that people perform in writing from sources. While research provides an understanding of some of the ways in which "context can give shape and direction to students' performance" (Marshall, 1987, p. 31), what are some possible ways in which an instructional context can motivate the transformations of meaning associated with organizing and selecting information in writing from sources?

Investigating the effects of writing an informational report or problem-based essay on how students construct meaning in the context of a history course is appropriate for two reasons. First, since historians value both the writing of reports and problem-based essays (cf. Stanford, 1986), a course in history provides a unique opportunity to explore the ways that these tasks enable students to think about a set of issues and how these tasks support learning. And second, history instruction and learning is emerging as an important field of educational research (cf. Beck & McKeown, 1988; Wineburg & Wilson, 1988). However, we are only beginning to understand how students learn the discursive practices of "ill-structured disciplines" (Spiro, et al., 1987; Voss, et al., 1983), such as history,

which do not have agreed-upon methods of analysis or generalized principles for presenting evidence (cf. Stone, 1979).

METHOD

Participants

The participants in the study were 15 juniors and seniors enrolled in an advanced course in social history, *European Lifestyle and Culture*, at a major university in the Eastern United States. Four of the students were history majors with a background in decision science and applied history. The remaining students, with backgrounds in chemistry, engineering, psychology, and management, had taken, on the average, two history courses in addition to *European Lifestyle and Culture*. The group of students was stratified by the researcher according to year in school and whether or not the students were history majors. A stratified random sampling procedure was used to assign students to one of two task conditions, report or problem.

Instructional Setting

To examine the nature of the classroom context and its possible influences on the ways students approached the tasks of writing either a report or problem-based essay, I collected all course documents (e.g., assignments, exams), observed each class, and took extensive notes on the questions the instructor posed and the answers students provided. I did not participate in any class discussions. I also interviewed the instructor on two occasions in order to understand the learning goals of the course and the philosophical assumptions informing his approach to teaching history.

The theme of the course, *European Lifestyle and Culture*, focused in part on the social and political structures of France, Germany, and Britain in the nineteenth and twentieth century. Students also examined national differences in European countries and national differences in periods of pan-European crisis. The Second World War was one of those experiences and served as a backdrop for the synthesis tasks—a report and a problem-based essay—that students completed for this study. They were a required part of the course, reflecting the instructional goals of *European Lifestyle and Culture*: to expose students to a body of knowledge about different ways of understanding historical events; to see links among different arguments in a variety of source texts; and to learn how to write clear and defensible arguments based on primary and secondary sources that introduced students to different rhetorical approaches.

The instructor of the course felt the tasks of writing either a report or problem-based essay would enable students to accomplish four primary goals. First, they would be able to "appropriate a body of knowledge that is theirs." He explained that they have to use their own language. "If they do it well, they have to translate what they have been reading into their own language." Second, he pointed out that the writing assignments would enable the students to recognize that there is such a thing as a point of view in historical argument: "Historical argument takes a particular form. It involves the selection and discussion of certain data and not others. It involves the contextualization of these data in some arguments and not others." Third, he observed that students should be able to think effectively about the world economy, the economy of the U.S., what sustains it, and the continuing relationship between the U.S. and European economies. Fourth, both tasks would foster a questioning frame of mind that concerns economic development and the financing of economic development in relationship to political autonomy and dependence.

The problem-based task, however, differed from the report task in that students were invited to assume the role of decision-makers who would reformulate possibilities that existed in U.S. foreign policy after WWII. This role, according to the instructor, would foster a sense of "play" in that students would be exploring the effects that change may have had on patterns of economic development, in addition to recognizing the "power of human intervention." Moreover, he was well aware that such a task was particularly relevant to students interested in decision science and applied history. In his words, "Their work in decision sciences and applied history is concerned with predicting outcomes based on different situations in which variables constantly change. ... In this case, they use similar skills in speculating about the possibilities of making changes in the past, in this case the distribution of aid in Europe after WWII."

The tasks of writing an informational report and a problem-based essay are similar to the kinds of writing required in other history courses at the university where this study was conducted and, therefore, were relatively familiar to the students participating in the study. Typically, students write analytical papers in which they evaluate evidence, using factual evidence selectively to bolster particular claims. In large part, as one historian put it, writing requires that students define a problem, read sources, and try to "shed light on that problem, using their own ideas to solve that problem." A problem, according to this historian, "could be a pattern in need of explanation or it could be a question—why did someone do something or other? It could be less a why; it could be a how, a whether." The bottom line is that "They have to invent a problem." At the same time, she pointed out that students' ability to achieve authority rested on their ability to demonstrate a knowledge of how other historians had approached a similar issue or problem. While there may be some bias toward problem-solving, a kind of task that fosters critical thinking and individual contribution, there is also a bias toward a kind of writing that locates authority in textual sources. In solving problems, students must be faithful to the sources they use, verifying facts and presenting evidence accurately.

While students were not given direct instruction in writing a synthesis, the sequence of assignments in the course provided students with skills in using different types of sources and with a theoretical grounding in the constructive, rhetorical nature of historical writing. For example, the writing task that students completed three weeks before they wrote about the European Recovery Program asked them to compare a documentary film's treatment of the student demonstrations in Paris in 1968 with a written analysis. Such an assignment was designed, according to the instructor, to enable them to see differences in historical representation—the power to convey what happened and assign meaning to historical events. In making this comparison, students were forced to confront relationships between the "power of written analysis and the emotional impact of a film," recognizing that there is a point of view in historical argument. Students were obliged to examine the strengths and weaknesses of these two media in conveying what happened in Paris in the context of crisis.

Perhaps the most direct statements about writing historical arguments came when the instructor returned the graded assignment on the Paris demonstrations to the students, about two weeks before they wrote their papers on European recovery. For nearly 40 minutes, he discussed the criteria historians use in judging the adequacy of an argument, distinguishing the kinds of evidence historians use from the data philosophers and mathematicians might use, though he also pointed out that this criteria may differ from historian to historian. Particular emphasis was placed upon a) the importance of "marshaling" evidence, b) formulating an argument that is directed toward the evidence, and c) looking critically at the nature of the sources that historians use in constructing an argument (i.e., what is said and what is overlooked.)

Table 1
Source Texts: Topic, Length, and Repeated Ideas

		Units	Pages	Repeated Ideas[1]
Primary Sources				
Harriman Report (1947)	*A Report on European and American Aid*	268	7	12%
ECA Report (1950)	*A Report on Recovery Progress*	307	14	4%
Historians' Analyses				
Hogan (1987)	*The Marshall Plan: America, Britain and the Reconstruction of Western Europe, 1947-52*	724	22	12%
Ilgen (1985)	*Autonomy and Interdependence: Western European Monetary and Trade Relations, 1958-84*	199	9	1%
Milward (1984)	*The Reconstruction of Western Europe, 1945-51*	248	8	13%
Wexler (1983)	*The Marshall Plan Revisited: The European Recovery Program in Economic Perspective*	200	7	18%

[1]This represents the proportion of information in each source text that is repeated in other sources.

In large part, the instructor questioned what some historiographers have called a tradition of *archivism*, a tradition that reflects a strong faith in the objectivity of history and the belief that history is a cumulative science based on the amassing of facts (cf. Kellner, 1989; Megill & McCloskey, 1987). What is important in an archivist view is not readers—their beliefs and values, the times they live in, or questions they ask—but historical sources. Seen in this way the historian's chief task is to establish as firmly as possible events and states of affairs in the past and find the best words with which to describe them (cf. Stanford, 1986). His chief task is to construct a valid representation of the past.

As an alternative to a seemingly objectivist view of language and knowledge, the instructor called attention to the tenuous nature of historical explanation; history is the study of probabilities and possibilities, an expression of the rhetorical nature of history. Indeed, historians base their interpretations on rigorous methodology, requiring verification of facts and their logical relations, accuracy, and caution in drawing inferences. But historians do not mirror the historical field of naturally-occurring and human events in their rendering of history. After all, historical understanding is an act of judgment made on the basis of historical evidence and an historian's interpretive framework that guides his or her selective attention. To an extent, this framework looms as large as the evidence itself as historians determine significance, organize "textual" meaning, selectively evaluate information, and draw inferences about the basis for historical change.

Table 2
Repetition across Source Texts

Content Units	Proportion of Units Repeated across Sources
Units Unique to a Single Source	.89
Units Repeated in Two Sources	.05
Units Repeated in Three Sources	.05
Units Repeated in Four or More Sources	.01

From this perspective, conveyed implicitly and explicitly throughout the term, history is an act of reconstruction that includes the rendering of past events and historical evidence in light of one's own purposes, prepossessions, and prejudices. In this act of reconstruction of an intangible world of the past, historians aim at persuasion, dependent on judgment in a context of justification. As Megill and McCloskey (1986) observe, separation of rhetoric from the process of organizing, selecting, and connecting ideas is a mistake since rhetoric supplies "the standards of inclusion and exclusion" (p. 228).

In the end, authority apparently rests on being accountable to consensus in the field of history, stabilized by disciplinary texts, as much as individual contribution. The notions of accountability and contribution point to a fundamental tension between locating authority in *texts* (i.e., a discipline's historical antecedents) and in historians who construct interpretations of history. This tension played itself out in the context of the course on European history in that the instructor encouraged students to think critically about historical issues, challenging the nature of historical representation in historians' analyses. At the same time, he also wanted to develop consensus, insuring that students had a shared understanding of terms, concepts, and interpretations. Such knowledge provided the basis for challenging the authority of the sources.

Source Texts

Each student participating in the study wrote a synthesis based on six source texts (Table 1) that provided different observations and rhetorical approaches in evaluating the European Recovery Program (ERP). These sources also included a range of visual information (e.g., figures and graphs) in presenting information about the ERP. The six source texts students used to write their essays could be construed as an *intertextual web* of information that included explicit repeated information about the recovery program, as well as implicit traces of intertextual connections. Repeated ideas were tabulated by counting content units which appeared in more than one source text (Spivey, 1983). As shown in Table 1, the source texts actually included relatively little repeated information, thus requiring students to search for implicit intertextual information (Ackerman, 1989).

Repetition across Source Texts

Of the 1946 content units available in the six source texts, some units were unique to a single text, some were present in two texts, some in three, and in four or more texts. Table 2 provides information about the proportion of total information that was repeated

across source texts, indicating a proportionate distribution of information across the six source texts.

The Writing Tasks

The writing prompts designed by both the instructor and researcher reflect the kinds of writing that historians and students of history commonly perform. They also reflect the different purposes that shape the kinds of constructive processes that people engage in as they read and write (cf. Frederiksen, 1972, 1975; Applebee, 1981, 1984; Britton, Burgess, Martin, McCleod, & Rosen, 1975).

Report Task:

> Recently, historians have begun to review the effects of the European Recovery Program (ERP), also known as the Marshall Plan, a program that was instituted a little more than forty years ago. Historians of the plan have pointed out that American decision-makers had a number of important political, economic, and strategic goals in mind when they conceived of the ERP, but faced opposition both here and in Europe, which affected planning and implementing the program. *Write a paper that presents your understanding of issues surrounding the European Recovery Program, basing your discussion on the sources that you have been given.*

Problem-based Task:

> Recently, historians have begun to review the effects of the European Recovery Program (ERP), also known as the Marshall Plan, a program that was instituted a little more than forty years ago. Historians of the plan have pointed out that American decision-makers had a number of important political, economic, and strategic goals in mind when they conceived of the ERP, but faced opposition both here at home and in Europe, which affected planning and implementing the program. *Write a paper in which you consider issues surrounding the ERP and, based on your understanding of the sources you have been given, propose conditions or options that planners might have attached to the ERP to insure that it would be more responsive to both European and American interests.*

Procedures

Data for this study were collected over a three-week period. In class, just before students received the writing assignment, all students were tested for prior knowledge. They were asked to jot down (e.g., freewrite) what they knew about the European Recovery Program after WWII, the North American Treaty Organization, and Free-Market Economy. Next, students were given one of two writing assignments in class, either a report-writing task or a problem-based task.

Students had 10 days during which to complete the task of reading the source materials and writing a 3-5 page essay requiring them to write either a report, describing issues surrounding European recovery, or a problem-based essay, discussing options and conditions that might have been attached to the ERP. All students were given a reading-writing log in order to obtain information about the time they spent reading and writing.

After all students had received one of the two assignments, they were asked to provide think-aloud protocols for 10 minutes in whatever setting they chose outside of

class. These were intended to capture students' initial impressions of the writing task, as well as their attempts to specify for themselves what was required and how they might proceed. In particular, students were asked to read the assignment from start to finish, commenting and thinking aloud into a tape recorder as they read. When they finished reading, students were instructed to explain in detail how they thought they might go about completing the task. (All students were trained to think aloud a week before they were given the writing task. They listened to a recording of a student solving a math problem. Students then practiced the technique of thinking aloud as they tried to solve a puzzle; cf. Fontaine, n.d.). When students were ready to begin a draft of their paper, that is any time during the 10 days they were given to complete the writing assignment, they were to provide a second 10-minute "think-aloud" in any setting they chose outside of class. The instructions were identical to the ones they received when they gave their first impressions of the writing task.

Immediately after they completed the writing task, 10 days after they were given the assignment, students provided a third and final 15-minute verbal report outside of class, again in any setting they chose. Their instructions were to evaluate how well they had fulfilled the goals of the writing task. After they finished and submitted the assignment in class 10 days after they were given the task, all students completed a posttest that was identical to the prior-knowledge measure.

Delayed Posttest

Three weeks after students were first given their writing assignment, they were asked to provide a delayed posttest that assessed their knowledge about European recovery, NATO, and Free-Market Economy. This measure was identical to the prior-knowledge measure and the posttest in that students were instructed to jot down what they knew about these three concepts.

Measures: Process Data

Think-aloud protocols were collected from each student participating in the study on three occasions, transcribed, and then read in light of the specific research question informing this study: how would students construe the report and problem-based tasks?

Task Interpretation

If students appeared to rely on the texts they were given as the only source of information, their interpretation of the task was coded as *Text*. If they saw that they could integrate prior knowledge with source information, their task interpretation was coded as *Text x Self*. Analysis of students' interpretation of task provides some understanding about their perceptions of authority and the choices and decisions they made as they structured the tasks they performed.

What follows are more explicit definitions of the coded categories for the two ways in which students interpreted a task and illustrations from students' protocols. Though it was possible for someone's interpretation to shift, little change was detected in the ways all of the students construed the tasks. Therefore, coding of the three think-aloud protocols for each student was collapsed into a single category:

Text

(1) really vague—discuss [issues surrounding the ERP] could mean anything ... not really interested in formulating an opinion ... try to

understand what each article was saying ... write a thesis that can cover everything and *get specifics from the texts.*

(2) write about what the plan was ... the goals of Marshall aid ... motives for Marshall aid as a major section and political, strategic, economic as subsections ... opposition to the plan with *specific examples.*

(3) goals—strategic, political, and economic ... that was the main thing we were asked to do ... maybe the opposition was in the assignment, but I focused on why the ERP was starting—I felt that was more important ... I didn't really try to do that. I didn't really try to say this is my view and try to defend it. I tried to show other things. Different arguments. I didn't want to leave anybody out. I didn't try to push anything. ... I didn't see a strong view I could take.

Protocols were coded as *Text x Self* when students' perceptions of the task suggested that they would have to go beyond the sources as a basis for their discussion of European recovery. Though students saw they would have to rely on historical analyses and primary sources, they indicated they would also rely on their prior knowledge (e.g., how individual nation states operate in political and economic arenas, the role that interest groups play in determining policy, their knowledge of economic theory). Below are excerpts from one student's protocols all coded as *Text x Self*:

Text x Self

(1) ... issues surrounding planning and implementing of the ERP ... He wants us to *assume the role of a decision-maker* ... what could have been done to make the plan more responsive to American and European interests.

(2) Consider issues (e.g., whether the program was effective or not), the goals of the recovery program, the consequences, and the alternatives ... Detail different country's positions ... *Propose conditions or options* ... *Argue with evidence* about whether the plan did what it set out to accomplish.

(3) Have to *draw conclusions from the articles* ... proposing conditions entails speculating but it has to be based on the articles ... *definition of the issues guides structuring of a proposal ... what was plausible* and what people at that time proposed.

As a check on reliability, a second rater coded five protocol transcripts (33% of the total sample). There was 100% agreement in coding the protocols.

Reading-Writing Time

Reading-writing time was obtained from students' reading-writing logs in which they recorded daily the time—in hours and fractions of hours—they spent on the writing assignment they were given. This variable is particularly relevant to a study of task differences, providing an additional way to see differences between tasks. Moreover, if students in one task group had spent significantly more time on a given task than the other, this factor would have been used as a covariate in analyzing group differences in the total amount of content units students included in their essays and in the proportion of source content included in their texts. After all, these differences could be an artifact of time or an effect of task.

Measures: Essay Analyses

Three separate analyses were performed in order to gain some insight into the constructive activity involved as students integrated information from sources and prior knowledge in light of the tasks they performed. Analyses focused on a) the organization (i.e., top-level structure) that framed a given essay; b) origin of information (i.e., the extent to which students relied on borrowed or added information); and c) for appeals to authority (i.e., citations).

Organization

Of particular interest to this research are the ways that different tasks invite students to restructure information in writing from sources. In addition, the ways in which they transform textual meaning through restructuring can be a useful lens for understanding how different writing tasks provide students with opportunities to assert their authority. For the analysis of organization, each student essay was read and analyzed in order to pinpoint the underlying logic, or frame, informing a given essay. As in Haswell (1986), the method of analysis consisted of identifying the top-level structure, that is, "the one logically coherent arrangement of ideas that embraces the largest number of words in the main body of the essay" (p. 403). Analysis of each essay consisted of finding the organizing principle that subsumed all of the content and relationships in the essays (e.g., causal connections). Categories used for classifying top-level structure were taken from Meyer's (1985) taxonomy of logical relations that operate in a text.

While Meyer and her colleagues (Meyer, Brandt, & Bluth, 1980; Meyer & Freedle, 1984) have analyzed texts that included explicit statements that indicate the gist or macroproposition, the essays analyzed in this study posed some problems that Haswell (1986) has also identified in his research. One is pinpointing the top-level structure in essays in which the gist is implicit, the pattern of development does not adhere to an altogether logical rhetorical sequencing of ideas, and in which transitions are not clearly marked. At a more theoretical level, structure may be perceived as a kind of *textual space* (Nystrand, 1982) created by both readers and writers, not simply a "characteristic of a text that exists apart from the people involved in producing and comprehending them" (Schallert, 1987, p. 73). Thus, there are limitations to any analysis that attempts to infer text structure or a writer's purpose.

As a check on reliability, a second rater independently judged 8 of the essays (53% of the sample) for top-level structure. This rater was introduced to Meyer's taxonomy, read essays written by students in a previous study of discourse synthesis (Spivey & Greene, 1989), and then identified the top-level structure of the essays. There was 100% agreement in rating these essays.

Origin of Information

To examine the origin of information in students' final texts—borrowed or added information—I prepared a composite template (cf. Spivey, 1983) of content units in the source texts. Such a measure was designed to examine the extent to which students in each task group relied on the authority of the source texts and the extent to which they introduced information from prior knowledge in order to contribute to the scholarly conversation revolving around European recovery.

The semantic content of each source text and each student's essay was parsed into content units in a modification of Ackerman (1989) and Kroll's (1977) procedure for analyzing clauses in written discourse. A set of rules for parsing sentences into clausal

units was based on Kroll's notion of "idea unit demarcations." As in Ackerman (1989; cf. Spivey, 1983), the size of a content unit was also based on an informativity principle, one that recognizes that both readers and writers construct meaning. To qualify as an idea unit, a clause or phrase must elicit a positive response to the question: Can this clause stand as a complete, factually correct, and informative sentence in a student's essay? This principle is fused with the concept of surface and lexical markers that signal a particular strategy (e.g., combining strategies for presenting relationships among ideas) that writers use to communicate their ideas (cf. Kroll, 1977).

Each content unit in a student's essay was scored as either *borrowed*, if the idea matched the semantic content in one of the source texts, or *added*, if the information did not match source content in the template. A unit was tagged as borrowed whether it was a paraphrase or a direct quotation. Determining whether a unit was borrowed was problematic, however, in instances when a student's essay did not incorporate actual lexical items from the sources.

As a check on reliability, a co-rater independently scored five essays (33% of the sample) in determining source of information. The scoring procedure was found to be reliable when tested with Cohen's *Kappa*, $k = .80$.

Appeals to Authority

The analysis of appeals to authority (i.e., use of citations) in this study is also related to selectivity, revealing some of the factors influencing writers' selections from "an intertext of related work, such as the use of citations to align oneself with certain people" (Spivey, 1990, p. 276; cf. Cronin, 1984). What was the frequency of students' use of authorities in the field in writing either a report or a problem-based essay? Such an analysis also focused upon the ways students used the source texts in establishing their own authority. Swales (1984) has shown that writers in the sciences and social sciences make rhetorical moves that establish the importance or relevance of their subject, citing authorities in a field as a way to situate their work and build on what others have done. Writers must also create a problem space, showing that there is a gap in the field. One way to do so is to locate faulty paths or arguments that we should avoid, arguing in support of our own position and describing how our own work can help fill a gap in a field's knowledge (Kaufer, Geisler, & Neuwirth, 1989; Kaufer & Geisler, 1991). As I have pointed out elsewhere, those who wish to contribute to the developing knowledge of a field must not only acquire content knowledge, but they must also be able to manage this knowledge within certain rhetorical and linguistic conventions (Greene, 1990a; cf. Berkenkotter, Huckin, & Ackerman, 1988). Thus, such a measure can potentially capture the ways in which students demonstrate their knowledge and use sources in authoritative ways.

Students' essays were first read and then their explicit appeals to authority were coded by two raters in terms of the function they served in presenting information about European recovery. Below are definitions of three kinds of appeals identified in the essays with illustrations of each:

1. To use as a source of content: The writer appeals to an author as a source of information.

> In *The Marshall Plan: America, Britain and the Reconstruction of Western Europe, 1947-1952*, Michael Hogan suggests that American decision-makers had a number of important political, economic, and strategic goals in mind when they conceived of the European Recovery Act or Marshall Plan.

2. ***To locate a faulty path***: A faulty path may be a line of argument that a writer thinks is mistaken or simply misses the mark and that a reader ought to reconsider or even avoid such an argument. Locating a faulty path consists of comparing points of view as illustrated below, but it also entails showing an alternative path signaled by words like *however*.

> Critics, such as Milward, argue that the hard work of the European citizens and the skill of their leaders contributed more than the Marshall Plan to the recovery of France, Italy, Belgium, West Germany, and Austria. In fact, some claim the ERP hurt Western Europe and the US more than it helped. ... Ilgen points out that austere living conditions requested during General De Gaulle's terms in office moved France back to a position of power in the foreign trade arena. *However, restored competitiveness of European products in world markets and the return of currency convertibility, as provided by the Marshall Plan, were responsible for such opportunities.*

3. ***To support a claim***: The writer appeals to an author to provide support for a line of argument.

> Although problems and disputed ideologies existed during the time the Marshall Plan was implemented, there is evidence that the plan itself was successful for Western European countries. The late 1950s yielded the European Common Market which proved that European exports could compete successfully in world markets as well as European monetary recovery (Ilgen, p. 28).

As a check on reliability, a second rater coded students' use of citations in five student essays which included a total of 56 citations. The rater first read a given essay, in which citations were highlighted and numbered, and determined its use in the context of the surrounding text as in the examples above. Interrater reliability using Cohen's *Kappa* was $k = .86$.

Measures: Learning

The last question motivating this study focused on the potential effects that different kinds of writing can have on qualitative (i.e., organization) changes in learning. The measure of prior knowledge, the posttest, and the delayed posttest were identical in that on each of three occasions students were asked to jot down facts they knew about the following concepts: The European Recovery Program after WWII, the North American Treaty Organization (NATO), and Free-Market Economy.

Prior Knowledge Measure, Posttest, and Delayed Posttest

This procedure provided a qualitative index of the organization of the knowledge individuals had before they wrote about European recovery, after they completed their papers, and three weeks after they were first given their writing assignment (cf. Langer & Nicholich, 1980; Langer, 1984; Newell & MacAdam, 1987). On each occasion, students were given one concept at a time and two minutes to write what they knew about each concept.

Students' prior knowledge measures, posttest, and delayed recalls were read and then analyzed using three ordered categories of knowledge organization based on a taxonomy created by Newell and McAdam (1987; cf. Langer, 1984): (a) *Highly Organized Knowledge*, consisting of superordinate concepts, definitions, and analogies; (b) *Partially*

Organized Knowledge, including examples, attributes, and defining characteristics; and (c) *Diffusely Organized Knowledge*, consisting of associations and personal experience. A highly organized response received a rating of 3, a partially organized response received a rating of 2, and a diffusely organized response received a rating of 1. A score for each student was calculated by adding up the ratings for each of three concepts. The highest overall rating was 9 (i.e., if a student received a score of 3 on each of the 3 concepts) and the lowest was a 3 (i.e., if a student received a score of 1 on each of the 3 concepts).

As a check on reliability, a second rater was trained using examples taken from psychology to illustrate each of the three levels of knowledge. Next, the rater was given the source texts to read and the meaning of each concept was then discussed. This was followed by instruction in applying the three levels of organization to information unrelated to European recovery. Cohen's *kappa* was used to calculate interrater reliability: $k = .94$ for ERP, $k = .86$ for NATO, and $k = .78$ for free-market economy.

DATA ANALYSIS

Analysis of variance (ANOVA) with repeated measures was used to examine differences between students' appeals to authority in writing either a problem-based essay or report and qualitative changes in learning. For each measure, assigned task was the between-subjects factor. The within-subjects factor for students' use of sources was type of appeal to authority (i.e., as a source of content, to locate a faulty path, or to support an argument). Newman-Keuls multiple comparison test was used to locate significant differences among group means. Time of assessment (i.e., prior to writing, after writing, and after three weeks) was the within-subjects factor for the learning measure. One-way ANOVA's were used to examine differences in students' reading-writing time and origin of information (i.e., borrowed and added), with assigned task serving as the between-subjects factor. For analysis of categorical data (i.e., students' interpretation of task and organization of students' essays) a chi-square test was used. To stabilize the variance, *proportions* were converted using an arc sine transformation (Beckel & Docksum, 1977; Snedecor & Cochran, 1980). A square-root transformation was used to convert frequency counts in order to stabilize the variance (Snedecor & Cochran, 1980). Discussion of results includes data that have not been transformed for ease of interpretation (cf. Durst, 1987).

RESULTS AND DISCUSSION

The results of this study suggest that the report and problem-based tasks had differential effects on the ways students construed these tasks, generated content, and restructured information.

Analyses of Process Data

Think-aloud protocols were collected in order to provide some insight into how students approached the assignments they were given, in particular, the extent to which they felt they could use and transform sources in fulfilling their rhetorical purpose. To what extent did they feel they should rely on the authority of sources or contribute relevant information from prior knowledge? Students' reading-writing logs also provided an account of how much time they spent on the report task and problem-based task.

Table 3
Observed Frequencies of Two Task Interpretations for Two Task Conditions

	Report (N=7)	Problem (N=8)	Total
Text	6	2	8
Text x Self	1	6	7

$X^2(1) = 5.52, p < .025$

Task Interpretation

As expected, the two groups of students differed significantly in the way that they interpreted the two tasks. The analysis, shown in Table 3, revealed that more of those writing reports perceived their task as one that required them to rely on the sources to write their essays. Most of those writing problem-based essays were apt to see that they should integrate prior knowledge with textual information, at least in how they construed the task.

Reading-Writing Time

An analysis of variance (ANOVA), performed to test differences between the two task groups for the amount of time spent on writing a report or problem-based essay, showed no significant differences between groups, F (1, 13) < 1. Therefore, reading-writing time, based on students' reading-writing logs and calculated in hours, was not used as a covariate in any of the analyses that follow. The mean for students writing problem-based essays was 12.68 hours (SD = 4.66) and the mean for those writing reports was 13.11 hours (SD = 3.61).

Essay Analyses

The second and third questions motivating this study focused on whether students writing reports and problem-based essays differed in the ways they restructured textual information or in their selection of content for writing synthesis texts. Analyses were designed to examine and compare the kinds of transformations of textual meaning students made as they organized and selected information.

Organization

An analysis of students' texts, shown in Table 4, indicated that there were significantly different patterns of organization for those writing reports and problem-based essays. Reports were characterized as having a collection structure. For the most part, students writing problem-based essays organized their ideas in a response pattern in which a statement of a problem was followed by a solution. This method of analysis consisted of identifying the top-level structures of students' papers, the categories for which were based on Meyer's (1985) taxonomy of logical relations that operate in a text.

Table 4
Observed Frequencies of Two Text Structures for Two Task Conditions

	Report	Problem	Total
Collection	7	2	9
Problem-Solution	0	6	6

X^2 (1) = 8.75, $p < .005$.

Though one might expect that collection and response structures are primarily associated with report writing and problem-based essay writing respectively, previous research (Spivey & Greene, 1987; Spivey & Greene, 1989) has shown that other patterns of development, such as comparison and description, emerge as well. Nonetheless, two patterns of organization were identified in an analysis of each of the 15 students' essays written on European recovery: collection and response (i.e., problem-solution).

Figures 1 and 2 provide a visual description of the organizing principles that framed students' ideas about European recovery. A collection structure embodies a relatively loose pattern of organization in that issues surrounding European recovery, for example, can be developed in list-like fashion with a set of attributes that detail the nature of each issue. These descriptions are grouped on the basis of topic or association. This principle is illustrated in one student's essay in which she presented three issues linked numerically:

> The balance of power Western Europe was to have after the reconstruction was a major issue involved in the Marshall Plan. ... A second important issue surrounding the ERP was the issue of European political and economic integration. ... The last issue surrounding the European Recovery Program to be discussed is the extent and type of aid to be given.

Figure 1. Collection structure.

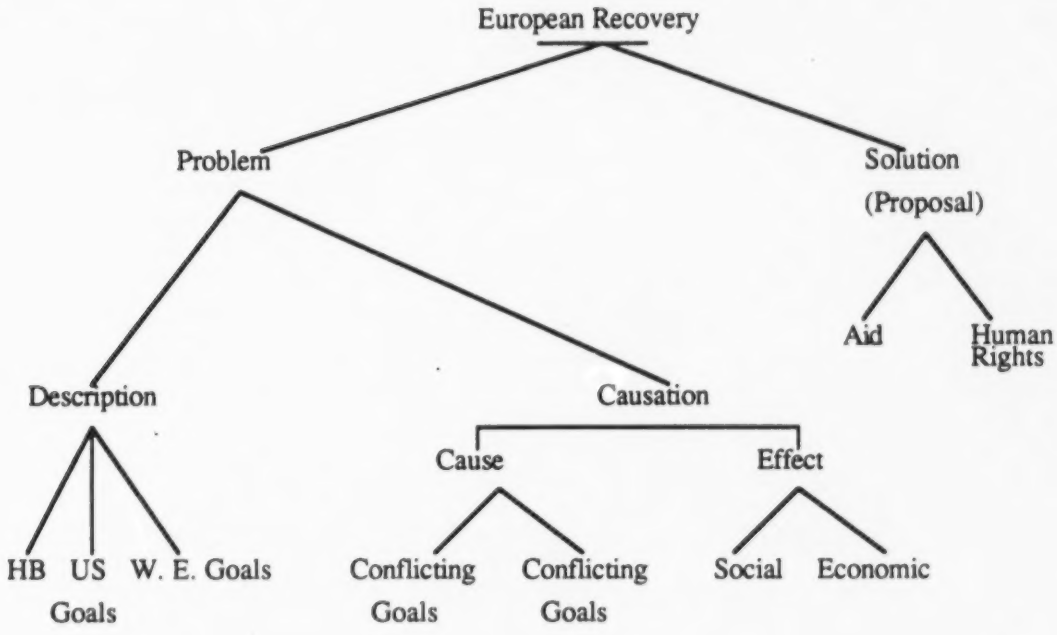

Figure 2. Problem-solution structure.

For Meyer (1985), a problem-solution structure coheres by virtue of the response pattern that characterizes such a structure: a problem is posed and a solution is offered. A problem is composed of a description of attributes, including, for instance, historical background (HB in Figure 2) or U.S. and Western European goals for economic and political development, all of which can give a reader a sense of what is at stake in implementing a recovery program in Europe. A major portion of the problem statement is devoted to explaining why there is a problem (or problems) and how this problem contributes to some need. Figure 2 shows that this explanation can consist of a discussion of a set of goals and conflicting goals that adversely effect the economic or social structure of a given country. One student, for instance, suggested that the Marshall Plan "was too oriented toward industrial productivity and neglected the needs of individuals and social classes." Here the student identified two conflicting goals: the need to stabilize the European economy and the need to improve the standard of living for individuals living in Western European countries. For this writer, rapid industrialization took precedence over concerns for individuals, creating gains of one sort, but deprivation as well, thus creating adverse effects in both economic and social arenas. The program, he argued in posing alternative options and conditions (his solution), could have included "domestic measures, such as insuring adequate food supplies and restoring the stability of the family unit." In this pattern of organization, the solution is interrelated with the problem.

Origin of Information

This analysis was designed to examine the extent to which students relied on the authority of sources or introduced information from prior knowledge, relying on their "own" authority. Findings show that students writing problem-based essays included

significantly more content units in their essays than those writing reports, $F(1,13) = 4.64$, $p = .05$. The total number of content units for those writing problem-based essays was 173.62 ($SD = 54.09$) and the total number for those writing reports was 126.28 ($SD = 22.16$). A second ANOVA tested to see if students from either group included larger proportions of content from the sources. The proportions were not significantly different, $F(1,13) = 1.62$, $p = .22$. The *mean proportion* of source units to the total number of content units included in students' problem-based essays was .62 ($SD = .16$), and the mean for those writing reports was .71 ($SD = .19$).

Taken together, the findings that students in both task groups differed in the ways in which they interpreted the tasks of writing either a problem-based essay, restructured textual information, and selected content may not be altogether surprising given previous research on constructive processing. What is curious, however, is the way that structure appears to serve as a kind of heuristic space for generating content. As in Frederiksen (1972, 1975), students solving a problem not only constructed a different representation of meaning, but generated more overall content in the essays they wrote than those asked to report on what they understood, in this case what they understood about issues surrounding European recovery. Analysis of the top-level structure of students' essays revealed that students in each task group structured information in different ways: students writing reports organized their essays in a collection structure and those writing problem-based essays organized their work in a "response" pattern (Meyer, 1985) that included both a problem and a solution. That students constructed different representations of meaning can be explained by the different transformations they performed, in particular the different principles they used to restructure textual meaning. The problem-based task appeared to require students to restructure information by supplying a "new" organizing pattern not found in the sources and they apparently used this structure, or configuration of meaning, to generate more content than those writing reports. As in Spivey's (1984) study, those writing reports reordered and restructured, but the structure of meaning they built did not invite extensive generation of content. These results provide some insight into the conditions under which we might expect writers to generate more content than other conditions as they construct meaning in writing from sources. Spivey (1990) has theorized that a task "invites a particular form ... that must be filled in a particular way. For a representation to 'fit' the communicative context, it must fill the space" (p. 278). However, students' goals also provided a structure of meaning or path that informed the ways in which they performed a given task.

Though analyses revealed task differences in the overall amount of content students included in their essays, analyses did not reveal task differences in the proportion of source or added information used in writing synthesis texts. Since students writing problem-based essays were invited to propose solutions to an unresolved problem, one could expect that they might have included significantly more information that they already knew in writing their essays than those students asked to discuss issues based on their reading of the sources. Yet these expectations mask what was actually happening as students performed the two tasks. Analyses of texts and think-aloud protocols reveal the extent to which students writing both types of essays felt they were accountable to the information presented in the sources. While their interpretations of the two tasks differed significantly, students writing reports and problem-based essays relied on sources in writing their essays to demonstrate that they had done the reading and that they knew what the key issues and problems were. At the same time, even though students writing reports uniformly interpreted their task as constraining their use of prior knowledge, text analyses show that two students writing reports included a relatively large proportion of information from prior knowledge. In fact, analyses show that 35% of the information they included was from prior knowledge, which is closer to the mean for those writing problem-based essays (38%) than for those writing reports (29%).

One of the two students mentioned above explained he "couldn't go straight from the assignment." In his think-aloud protocol after he completed his paper, he asserted that he had to give his own opinion. It was more important than simply reciting what was in the texts. "I didn't think it would be as helpful to my reader to simply recite. ... It was more important to express what I felt was important." In this comment, he provides a rationale for why he made the choice he did in departing from the task he was given, reflecting an awareness of audience and situation, as well as a sense of personal authority. He constructed an image of the teacher as someone who values the ideas of students and appreciates students' willingness to go beyond the task.

Though this student was not typical, let me suggest that the instructional context which surrounded the writing tasks described in this study can provide at least one possible explanation for why the two students writing reports felt compelled to include a relatively large proportion of ideas from prior knowledge and experience. Given that the task of writing a report consisted of discussing controversial issues in the context of a course that encouraged independent thought, it may not be all that surprising that some students transformed the report task into one that gave them an opportunity to contribute their "own" ideas. Indeed, one could speculate that some students may have begun to internalize the strategies for writing about history in a problem-solving mode introduced, discussed, and applied in the course they were taking.

Though we might think of report-writing and problem-solving as distinct tasks that invite students to construct meaning in different ways, much depends on the instructional context, as well as individual students' choices and decisions about how to perform a task. In turn, students' decisions can be based on their perceptions of what their reader expects in a given social situation.

Appeals to Authority

An analysis of students' use of citations, an index of authority, was designed to examine the ways in which they demonstrated their knowledge of the issues revolving around European recovery. Curiously, there was neither a significant effect for task on students' appeals to authority, nor a significant interaction between type of appeal, the within-subjects factor, and task. Instead, students in both task groups tended to follow a similar pattern in their use of citations as sources of information rather than as resources for supporting an argument or locating a faulty path. Indeed, there was a significant effect for type of appeal, $F\ (2, 26) = 10.36$, $p < .001$. Table 5 shows the overall means and standard deviations for each type of appeal.

A Newman-Keuls multiple comparison test, set at the .05 confidence level, determined that there were significant differences among means for students' use of three types of appeals to authority in writing their essays. Students appealed to authority more as a source of content than they did to locate a faulty path. They also appealed to authority as a source of content more than as a resource to support an argument.

Given the theoretical assumptions of this study, one might have predicted that students writing reports and problem-based essays would appeal to sources in significantly different ways. Those writing reports were expected to rely on source content more than those writing problem-based essays and make more overall appeals to authorities primarily as sources of information. Those writing problem-based essays were expected to rely on their own authority, contributing knowledge they already had about American foreign policy. Moreover, they were expected, if only implicitly, to show why the European Recovery Program was not successful with supporting evidence and to provide a rationale

Table 5
Means and Standard Deviations for Appeals to Authority

Appeals to Authority	Report	Problem	All
Total Appeals	10.29 (9.27)	12.13 (7.18)	11.21 (7.96)
Content	7.71 (8.67)	6.88 (3.64)	7.26 (6.25)
Faulty Path	0.57 (1.13)	1.50 (2.14)	1.03 (1.74)
Support an Argument	2.00 (1.3)	3.75 (3.50)	2.93 (2.76)

for the solutions they offered. Thus, they would invoke authorities less as a source of information and more as a source of evidence to support their claims.

Again, however, these expectations belie what was actually happening. Both groups of students appealed to authorities in the field as important intellectual touchstones, demonstrating to a reader—their instructor—an awareness of key issues or problems. Relying on the authority of sources can suggest a lack of confidence in one's own authority, but it does not preclude achieving authority as a writer develops an intellectual project of his or her own (cf. Bartholomae & Petrosky, 1986). After all, writing from sources emphasizes the intertextual and eminently social nature of discourse synthesis. To enter a conversation entails using published authorities in different ways: to lay out what has been said about a topic, issue, or problem; to support one's argument in light of what others have expressed; and perhaps to use one's authority to criticize another perspective in order to establish one's own point of view. Indeed, some students in both task groups saw the opportunity to critique a position, appealing to authorities as a source of evidence. In doing so, some students writing reports and problem-based essays adapted and transformed source information in order to assert their authority, playing one discourse off of another in order to contribute their own perspective or propose their own alternative to a plan designed to aid European recovery. That is, they strategically placed information in the texts they wrote and adapted points of information presented in the source texts to support a claim in order to fulfill their goals as writers.

The ways in which students appealed to authority might also reflect a fundamental tension that persisted in the classroom context described earlier and can provide us with a picture of their attempts to learn how to enter what for some was a new discourse. This tension points to students' need to invoke the authorities of a discipline in order to demonstrate their awareness of issues, on the one hand, and the degree to which students could take charge of their own ideas, on the other hand. Though the instructor encouraged students to think critically about the nature of historians' representations of historical events, considering what was said *and* what was left unsaid, most students tended to appeal to authorities in the field as sources of information. Those who appealed to authority to advance their own ideas or to locate a faulty path in an historian's argument to

Table 6
Means and Standard Deviations for Pretest, Posttest and Delayed Posttest

Time of Assessment	Report	Problem	All
Prior-Knowledge Measure	4.00 (.81)	4.87 (1.55)	4.43 (1.30)
Posttest	5.71 (2.06)	6.62 (1.40)	6.20 (1.74)
Delayed Posttest	5.85 (1.86)	6.25 (1.16)	6.06 (1.48)

set up their own position had apparently learned part of what it means to write and think like an historian, at least from the point of view of one who sees the writing of history as an interpretive, constructive act. In fact, this is the philosophical position taken in the course, *European Lifestyle and Culture*. That others had not employed these kinds of rhetorical moves, particularly those students writing problem-based essays, calls attention to the potential difficulties of entering a new discourse and of knowing how to set up a scholarly project. Such a project entails adapting and transforming source information to meet one's own discourse goals. In the end, what strategies are involved in constructing an historical interpretation? The answer can vary, depending on whether they see historical representation as an act of judgment that can be challenged, or perceive history as a chronicle of facts, adopting an *archivist* view of history.

Learning

The final question motivating this study was whether different tasks of writing from sources would differentially affect qualitative changes in learning. Such a question developed out of the primary assumption that if different tasks invite students to perform different operations of organizing and selecting information as they build representations of textual meaning, there would be differences in learning. Though there was not a significant effect for task on qualitative changes in learning, the organization of all students' knowledge about European recovery changed significantly from the prior-knowledge assessment to the posttest, $F(2, 26) = 9.06$, $p < .001$. As shown in Table 6, the means for all students increased from 4.43 ($SD = 1.30$) to 6.20 ($SD = 1.74$), where they seemed to plateau.

That the measure for learning did not reveal differences between students writing reports and problem-based essays may suggest that such a measure is simply not sensitive enough to detect differences in the structure of knowledge when students write from multiple sources. Other measures used in this study, however, were designed to examine the kinds of transformations of meaning that different tasks of writing can effect and can be linked to topic understanding (cf. Ackerman, 1990). After all, a key assumption in this study was that a constructivist framework could explain the effect of different writing tasks on qualitative changes in learning. Since people build different representations of meaning because they perform the operations of organizing and selecting information differently,

they gain a qualitatively different understanding of a given set of concepts. In this study, the kinds of transformations of meaning associated with organizing (i.e., restructuring) and selecting (e.g., integrating prior knowledge with source content) point to some possible ways that writing from sources can direct an understanding of historical concepts. Writing a problem-based essay entails restructuring of information in different ways than writing a report, as well as integrating content generated from memory with source information. By emphasizing differences in this analysis, I do not wish to downplay the integrative role that writing in general can play. Indeed, the learning measure revealed students' evolving understanding of a set of historical concepts related to European recovery, whether they wrote a report or problem-based essay.

It is important to note in this context that, while different tasks may invite different transformations of meaning (e.g., restructuring), a developing knowledge of issues can also "direct the writing process" (Newell & Winograd, 1989, p. 198; Applebee, 1984; Langer, 1984). That writers in the current study reconfigure source content differently and contribute their own ideas in different ways suggest the role that topic understanding plays in constructing meaning.

Summary of Results

This study sought to examine the kinds of transformations of meaning writers perform as they composed either a problem-based essay or report based on multiple sources and students' interpretations of these two tasks within a specific context—whether they felt they should rely on source information or contribute ideas from prior knowledge. I was also interested in the possible differences in learning that might result from writing either a report or problem-based essay. Since the instructional context appeared to influence some students' responses, it is difficult to generalize beyond this particular context and these two tasks. Still, the results cited above do help to specify the nature of task differences that manifest themselves in two relatively structured assignments of writing from sources and thus adds to our knowledge about how students envision ways to perform complex academic tasks (cf. Flower, 1987, 1990; Nelson, 1990). Differences in text structure provide concrete descriptions of how students' perceptions of task play themselves out in constructing meaning in both reading and writing, revealing the kinds of structural transformations that different tasks of writing appear to invite. By specifying how tasks differentially affect elements of constructivity, the research reported here has attempted to extend theory about how writers transform texts as they organize and select information in keeping with their discourse goals. In doing so, this study builds upon prior research in composing from sources, in particular, Spivey's (1984; cf. Spivey & King, 1989) examination of the transformations students make in writing factual reports and Ackerman's (1990) study of prior knowledge and its effects on how writers construct meaning in writing analytical essays.

SPECULATIONS ABOUT AUTHORITY IN WRITING FROM SOURCES

As suggested throughout, constructivist theories of reading and writing can provide a framework for thinking about how elements of constructivity can vary as people perform different tasks of writing from sources. I now want to argue that a constructivist framework can also give us a way to think about students' authoritative use of sources, in particular the kinds of contributions they make to scholarly discussions. Writers' unique contributions appear to come from the *transformations* they make in constructing meaning in text, transformations that involve reconfiguring source content, restructuring the information they select from sources and from elaborating and making inferences as they interweave textual information with knowledge generated from memory. However, uniqueness, in itself, is not necessarily an index of authority. Writers' contributions often

rest on their ability to place their ideas strategically amidst what others have said. Still, the kinds of transformations associated with the operations of organizing selecting, and connecting can serve as a useful framework for thinking about the ways in which writers construct meaning and use information in authoritative ways as they fulfill their discourse goals.

An analysis of think-aloud protocols also suggests that authority can be linked to the kind of *control* that students demonstrate in setting goals and selecting strategies to fulfill their rhetorical intentions. The tasks of writing either a report or problem-based essay may have motivated the kinds of transformations of meaning students performed, but these tasks also invited them to weigh choices and options in setting goals and selecting strategies that will help them fulfill those goals. Students made choices in light of certain constraints, such as what it means to write an historical analysis, who will read their texts, and how much time they have to write their essays. In short, they negotiated tasks, developing an awareness of possibilities in light of their own goals as writers and the demands of a given situation. In this process of negotiation, they begin to appropriate both text and task as they invoke knowledge about "task goals and task structure" (cf. Raphael, Englert, & Kirschner, 1989, p. 345). Still, the extent to which students appropriate tasks and use sources in authoritative ways can vary as they perform different kinds of transformations associated with the operations of selecting and organizing information in constructing meaning.

In short, analyses of think-aloud protocols and students' essays suggest that authority can manifest itself in at least four ways (Greene, 1990b). First, authority is apparent in the *strategic knowledge* (Flower et al., 1990) students invoke as they read situations and determine how to use what they know to best effect. This knowledge includes the goals students set, the strategies they employ for achieving those goals, and their awareness of why they make the choices they do in writing from sources. With this awareness, students reveal a knowledge about how to *regulate* the processes of composing and comprehending, so that there is an element of *control* in how they approach and structure tasks. Second, authority can also rest, in part, on the type of *contribution* students make to a scholarly conversation. They introduce or "select" ideas from prior knowledge and experience, applying this knowledge to make new connections and provide novel perspectives in the texts they write. Third, they *appeal to authorities* in history to demonstrate their knowledge of key issues and ideas, to support their line of argument, or to highlight their stance on a given set of issues or problems. Their appeals to authority serve as "intellectual and social touchstones" (Kaufer & Geisler, 1991) that help to demonstrate their awareness of alternative positions and the canonical knowledge developed in the field of American foreign policy.

Finally, students assert what I term *constructive authority* (Greene, in preparation) in making judgments about what is important in investigating the European Recovery Program. These judgments manifest themselves in the ways students restructure information, positioning their ideas in light of their goals as writers, thereby enforcing a way of seeing a particular issue or problem. Still another manifestation of constructive authority is the formal categories students create, transforming specific ideas into generalized statements in which they name a problem or issue. Though students may have relied on texts as a source of information, regardless of task, *restructuring* of information represents an act of appropriation in which they combine and recombine information from source texts to meet their own discourse goals or supply a new pattern of organization. In this context, appropriation suggests ownership but, more importantly, it entails transforming information effectively in a given rhetorical situation. This distinction points to a fundamental tension in students' attempts to achieve authority. The transformations they perform in organizing and selecting information can reflect personal goals, but the

appropriateness of the choices students make is, in large part, determined by a social situation. Thus, students must find ways to balance individual contribution, in which they take charge of their own ideas, on the one hand, with the goal of meeting the expectations of a reader who sanctions an individual's attempts to achieve authority, on the other hand.

To conclude this discussion of authority, let me suggest that the four ways of thinking about authority I have described bring into balance the kind of canonical *knowledge* that Hirsch (1987) emphasizes as a necessary prerequisite for literate practice with *strategies* for using knowledge appropriately and flexibly (cf. Bransford, Sherwood, Vye, & Rieser, 1986; McLeod, 1990; Spiro et al., 1987). Writers evaluate goals, consolidate plans, and adapt what they know in performing a given task (Flower et al., 1990). These ways of thinking about authority also extend and develop the three kinds of transformations that Spivey (1990) has discussed in her research on discourse synthesis, in particular, how writers perform the transformations associated with organizing, selecting, and connecting information. Evidence from this study points to the authoritative ways people handle these kinds of transformations, specifically the strategies they use to interweave source content and relevant prior knowledge to say something "new," the ways they restructure information, and the principles they use in selecting relevant source content to support their positions.

In the end, a constructivist perspective helps to realign discussions of authority as an act of appropriation that is negotiated and constructed as writers structure and restructure knowledge. This is not to ignore the role that social structures play in constructing meaning (cf. Greene, 1990a). It does, however, shift an emphasis of authority as a public gesture to one that is invested with individual will and intention as writers construct a mental representation that includes previously acquired knowledge and information generated in both comprehending and composing. Locating authority within a cognitive framework forces educators to investigate the relationship between reading, writing, and knowing (cf. Ackerman, 1990), addressing how *individuals* construct meaning and contribute to ongoing conversations in both school and community.

IMPLICATIONS FOR FUTURE RESEARCH

The findings of this study indicate some of the differential effects that writing a report or a problem-based essay have on the construction of meaning and an understanding of historical concepts within a specific instructional context. However, this research has raised a number of questions that call attention to the kinds of variables both within a learner and social context that contribute to the ways that students perform different types of academic essay-writing tasks.

Further research might investigate the relationship between prior knowledge and the transformations readers and writers perform as they select information, add information in strategic ways, and restructure information. What is the role of a writer's evolving topic and conceptual knowledge in constructing meaning in complex reading-to-write tasks? An equally important concern is how a writer's strategic knowledge (i.e., goals, strategies, and awareness) motivates these kinds of transformations. Can authority in writing exist apart from strategic knowledge?

Finally, this study points to a need to probe more deeply into contextual factors that can influence performance, such as teacher-student interactions that occur within the classroom (Nystrand & Gamoran, in press) and in teachers' evaluation of students' written work. What kinds of questions does the instructor ask? What kinds of reasoning do these questions promote? How does the experience of the classroom relate to the kinds of writing students are asked to produce? What concerns does the instructor address in

commenting upon students' papers? How does the nature of a given task affect the kinds of comments an instructor makes? By answering these questions in a study that examines how students negotiate different tasks, we can be in a better position to discuss those factors that influence students' willingness or ability to create novel texts.

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